

# Applications of Scientific Visualization

Steven Walton  
University of Oregon

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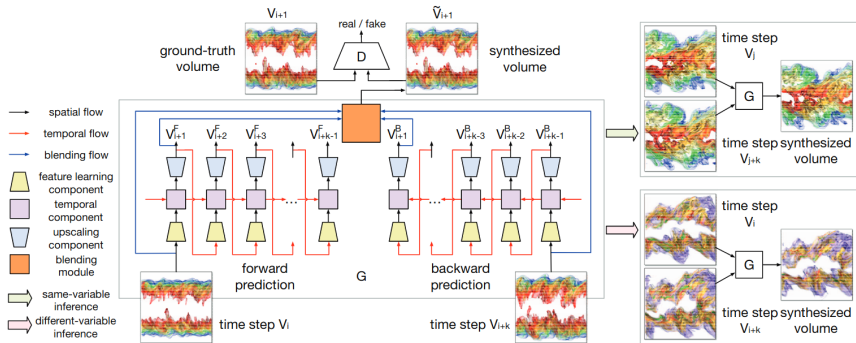
# Outline

- ▶ Research Topic: Machine Learning Solving HPC Problems
- ▶ Application: HPC Simulations to Enhance Drug Delivery Designs

# TSR-TVD: Temporal Super-Resolution for Time-Varying Data Analysis and Visualization

- ▶ HPC has issues with storing time-steps.
- ▶ Some researchers LERP between time-steps to find intermediate data.
- ▶ TSR-TVD is a machine learning implementation to synthesize timesteps.
- ▶ Researchers are modifying existing ML techniques to solve problems in HPC.
- ▶ <https://ieeexplore.ieee.org/document/8802285>

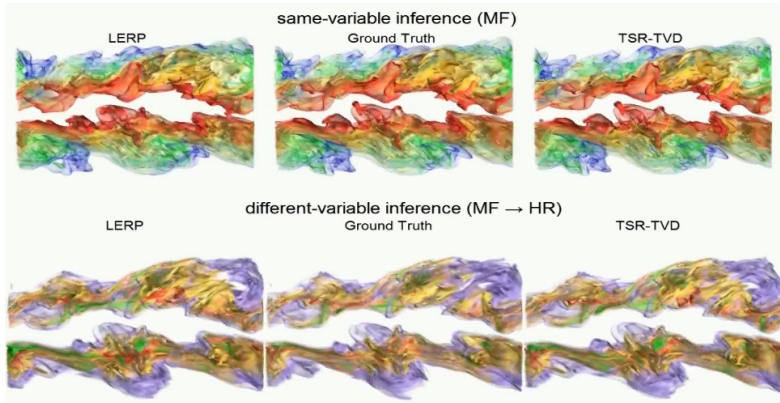
# TSR-TVD: Temporal Super-Resolution for Time-Varying Data Analysis and Visualization



# TSR-TVD: Temporal Super-Resolution for Time-Varying Data Analysis and Visualization

- ▶ Uses RNN to create forward and backward predictions
- ▶ Conv3D GAN adversarially trains network.
- ▶ TSR-TVD uses structure similar to TecoGAN

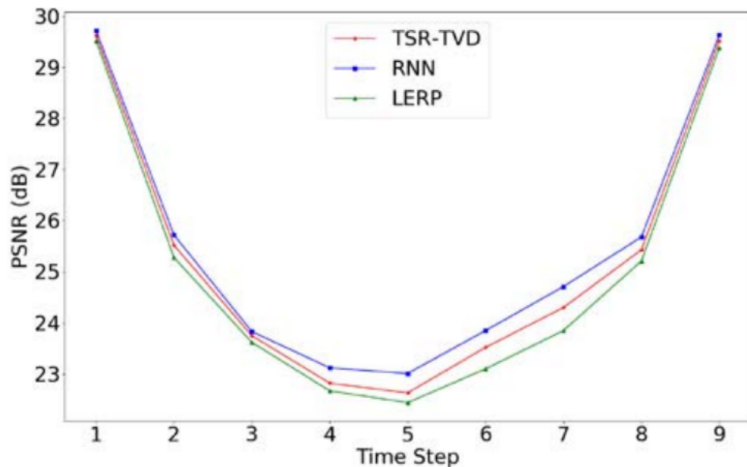
# TSR-TVD: Temporal Super-Resolution for Time-Varying Data Analysis and Visualization



Short Video

<https://vimeo.com/359998660>

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# Diamonds that deliver

- ▶ HPC simulations are used to solve complex problems such as drug delivery.
- ▶ <https://pubs.acs.org/doi/full/10.1021/>

